f	**Fermi National Accelerator Laboratory** **Batavia, IL 60510**

CMS ME3/1 INNER CATHODE PANEL COMPONENT SOLDERING TRAVELER

Reference Drawing(s)

Endcap Muon Chamber ME3/1 Final Assembly 5520-ME-368310

Endcap Muon Chamber ME3/1 Cathode Panel Assy

Inner Cathode 5520-ME-368313

Budget Code:	**Project Code:**
Released by:	**Date:**
Prepared by: M. Hubbard, B. Jensen, L. Lee	

Title	Signature	Date
TD / E&F Process Engineering	**Bob Jensen/Designee**	
TD / E&F CMS Assembly	**Glenn Smith/Designee**	
TD / E&F Technological Physicist	**Oleg Prokofiev/Designee**	
TD / CMS Project Manager	**Giorgio Apollinari/Designee**	

Revision Page

Revision	Step No.	Revision Description	TRR No.	Date
None	N/A	Initial Release	N/A	04/26/00

Ensure appropriate memos and specific instructions are placed with the traveler before issuing the sub traveler binder to production.

1.0 General Notes

1.1 White (Lint Free) Gloves (Fermi stock 2250-1800) or Nitrile Gloves (Fermi stock 2250-2040) shall be worn by all personnel when handling all product parts after the parts have been prepared/cleaned.

1.2 All steps that require a sign-off shall include the Technician/Inspectors first initial and full last name.

1.3 No erasures or white out will be permitted to any documentation. All incorrectly entered data shall be corrected by placing a single line through the error, initial and date the error before adding the correct data.

1.4 All Discrepancy Reports issued shall be recorded in the left margin next to the applicable step.

1.5 All personnel performing steps in this traveler must have documented training for this traveler and associated operating procedures.

1.6 Personnel shall perform all tasks in accordance with current applicable ES&H guidelines and those specified within the step.

1.7 Cover the panel/chamber with Mylar when not being serviced or assembled.

1.8 Never hand pass anything over a panel as dropped items may damage the panel.

2.0 Parts Kit List

2.1 Attach the completed Parts Kit List for the CMS Cathode Panel Component Soldering to this traveler. Ensure that the serial number on the Parts Kit List matches the serial number of this traveler. Verify that the Parts Kit received is complete.

_____ _____

Process Engineering/Designee Date

3.0 Panel Preparation

Completed

3.1 Acquire the appropriate Inner Cathode Panel as per serial number on the bottom of this traveler. Visually inspect the panel to ensure that there are no damages. ❒

3.2 Transport the Inner Cathode Panel using the panel transport cart (MD-368810) to the soldering station. ❒

3.3 Rotate the panel to horizontal with the serial number facing UP and place on the Cathode Panel Component Soldering Station using approved lifting methods. ❒

_____ _____

Technician(s) Date

X 3.4 Verify all Section 3.0 steps have been properly completed and signed off and the panel is acceptable for further processing.

_____ _____

Lead Person Date

4.0 Panel Soldering (Strip Side)

Completed ❒

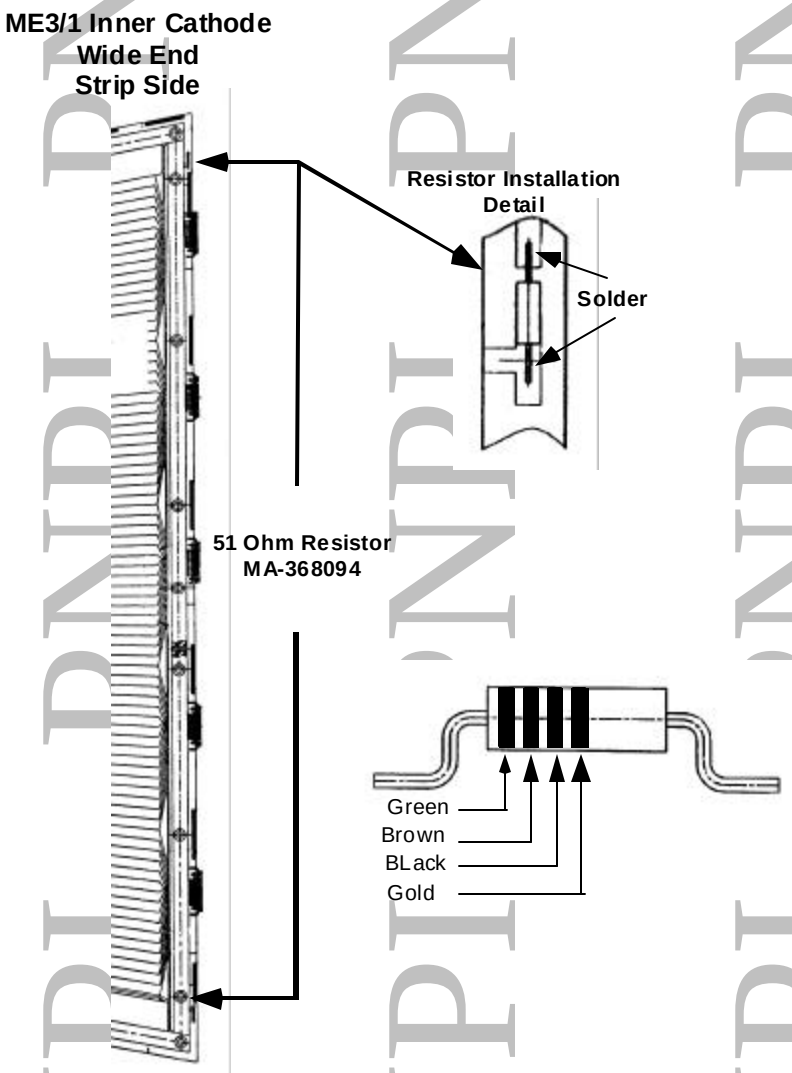
4.1 Install two 51 ohm Resistors (MA-368094) onto the panel at the wide end in accordance with Inner Cathode Panel Dwg (MD-368313) and diagrams below.

Note(s):

Verify correct color code of the resistors as per below diagram.

Verify correct locations as per Dwg and diagram below.

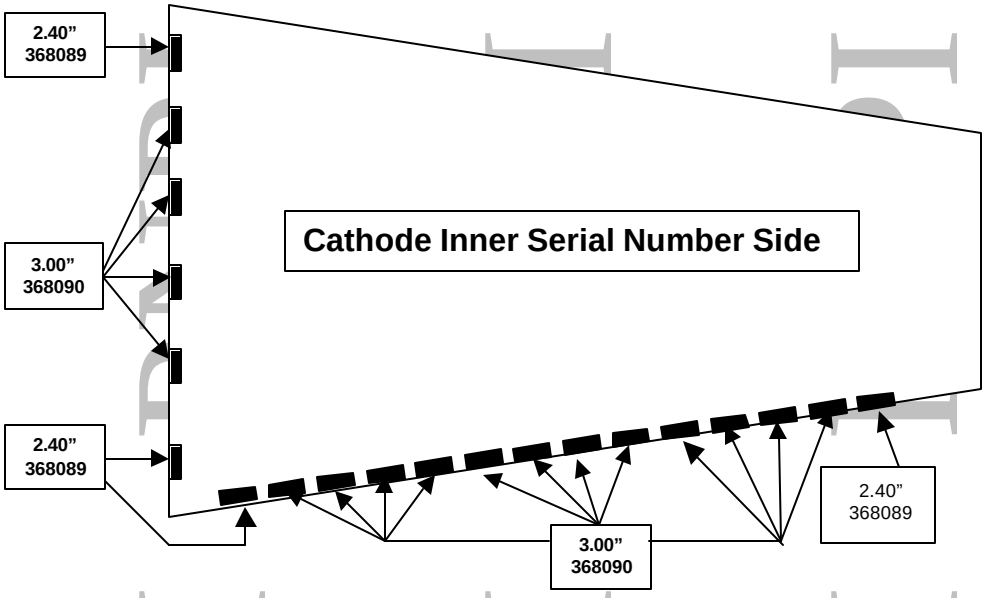
After soldering the resistors to the panel ensure that the resistor is not shorted to ground.



Technician(s) _____ Date _____

Completed

4.2 Using the Grounding Strip Foil Installation templates layout the panel for Grounding Strip installation. Mark foil installation area lightly using a scribe. ❒

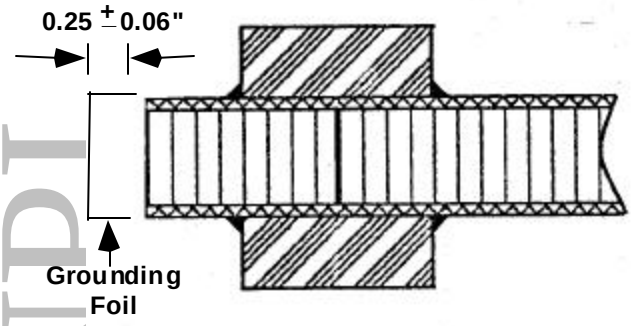


4.2.1 Foil layout scribed on left side of panel from the narrow end (14 locations). ❒

4.2.2 Foil layout scribed on Wide end of panel (6 locations). ❒

Technician(s) _____ Date _____

Completed



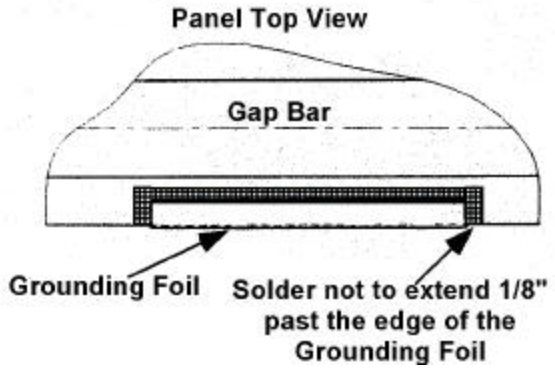
4.3 Form the Grounding Foils to the panel as per Dwg ME-368313 and the above diagram. ❒

4.4 Place a strip of Almit Solder (MA-368391) under the Strips at the top of the panel. Solder the Strips to the top of the panel Only!! Make sure the solder is smooth when cooled. Continue soldering the Grounding Strips tops to the panel until all the Grounding Strips have been soldered to the panel. ❒

Note(s):

When soldering foil to the panel, ensure that no more than 1/8" exceeds past the foil.

Ensure that after soldering of foil, there are no lumps or excess build up of solder on the panel or foil.



Technician(s) _____ Date _____

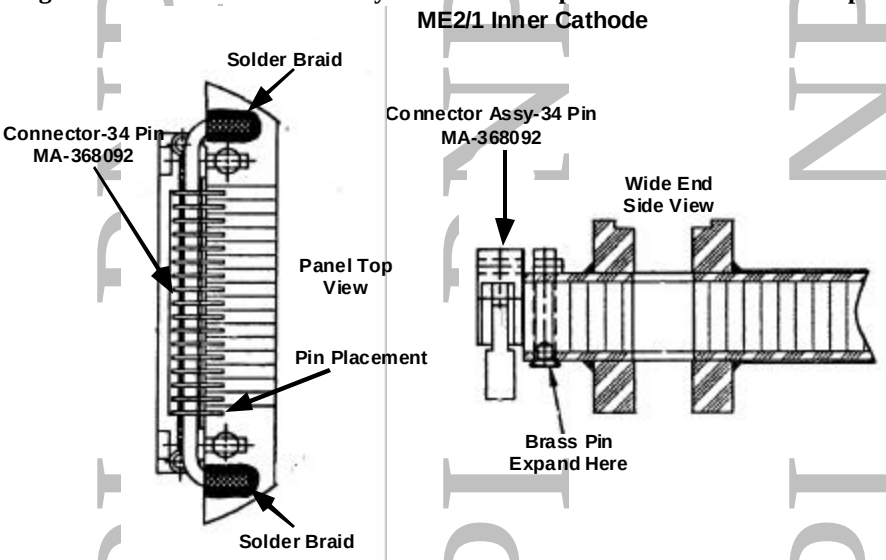
Completed

4.5 On the wide end of the panel, install the Connector Assy – 34 Pin (MA-368092)[5 ea] with brass pins as per Dwg 368313 and below diagram. ❒

4.6 Expand the brass pins on the 34-Pin Connectors(MA-368092) using the Crimping Tool (MA-XXXXXX). ❒

Note(s):

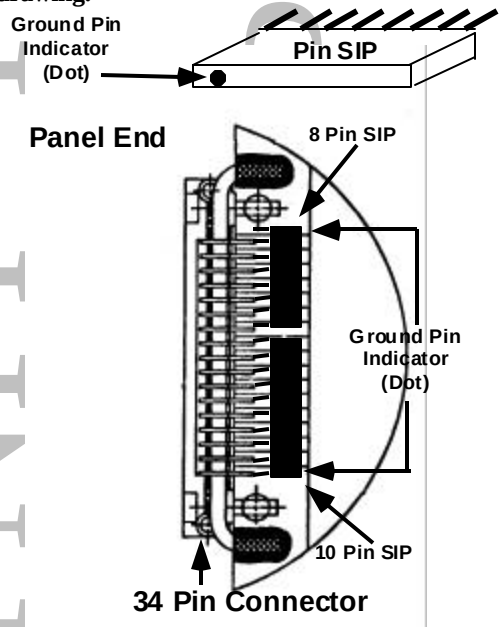
During installation of Connector Assy ensure correct placement of the17 solder pins.



4.7 Install 8-Pin and 10-Pin SIPs onto the top of the 34-Pin Connectors according to the diagram below. ❒

Note(s):

Ensure the Ground Pins (indicated by a dot) are located to the outside edges in accordance with the drawing.



Completed

4.8 Verify that all connectors and SIPs are in the proper location. Ensure the solder pins make contact with the panel, prior to soldering. ❒

Note(s):

Ensure that during the pin soldering operation that no solder flows to the adjoining pins.

4.9 Solder the Connector Assy pins and the SIPs pins to the panel using Almit Solder (MA-368291.) ❒

4.10 Solder the Connector Assy Braid, using Almit Solder (MA-368291), to the panel according to Dwg ME-368313. ❒

_____ _____

Technician(s) Date

X 4.11 Inspect panel to ensure that all components have been installed and/or soldered correctly in accordance with Anode Panel DWG 368313 and the panel is acceptable for further processing.

_____ _____

Lead Person Date

5.0 Panel Testing

5.1 Using a Multimeter measure the resistor value of both 51 Ohm resistors. Resistor value should read between 48 ? to 54 ?.

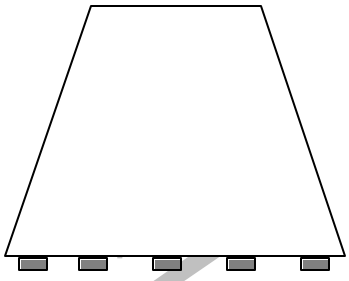
Resistor	Pass	Fail
Resistor #1		
Resistor #2		

Note(s):

If resistor measurement is not within range, replace the resistor. After replacement, re-measure the resistor.

Technician(s) Date

5.2 Using a Multimeter, and a Toggle Switch Box, check the continuity in resistance of the Sips. Beginning at the left side of the wide end, measure each strip by flipping the corresponding switch on the box.



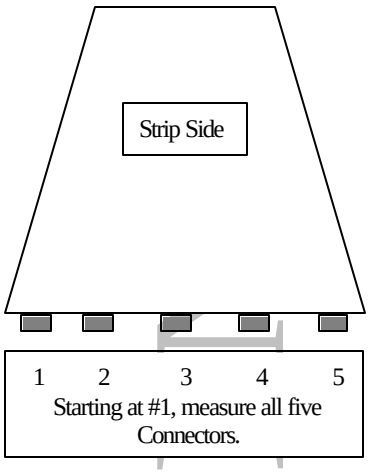
Note(s):

All measurements must be within the range of 0.9 – 1.1 Mohm.

Resistance Value?	**1 Meg Ohm**	
Sip Location	Pass	Fail
Location #1		
Location #2		
Location #3		
Location #4		
Location #5		

Technician(s) Date

5.3 Using a switch box, cable and LCR meter, measure the Capacitance from Strip to Ground.



		Cathode Connector				
		1	**2**	**3**	**4**	**5**
CHANNEL NUMBER	**1**					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
Range: LOW2HI						

Remarks: _____

_____

_____ _____

Technician(s) Date

X 5.4 Verify that all Section 5.0 steps have been completed and the panel is acceptable for further processing.

Lead Person Date

6.0 Panel Soldering (Non-strip Side)

Completed

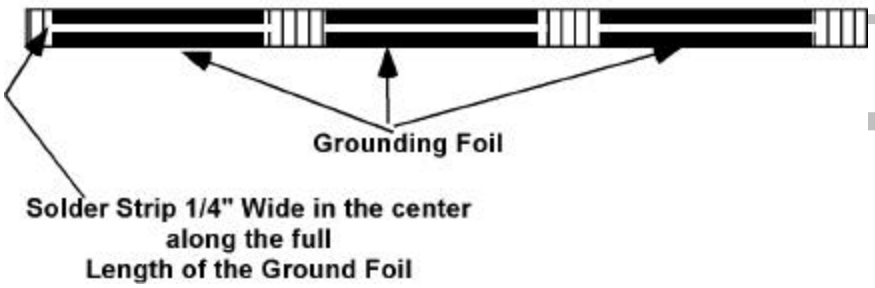
6.1 Rotate the Panel so the Non-Serial Number side is facing up, and re-install it onto the Panel Component Soldering Station using approved lifting methods. ❒

6.2 Solder all the Grounding Strips to the Non-Serial Number side of the panel. ❒

6.3 Trim away the part of the Grounding Strips that are covering over the bolt holes. ❒

6.4 Solder a ¼" wide strip in the center along the full length of each Grounding Foil. ❒

Panel Side View w/Grounding Foil



6.5 Transport the completed panel to the Cathode Storage area.

_____ _____

Technician(s) Date

X 6.6 Inspect panel to ensure that all components have been installed and/or soldered correctly in accordance with Anode Panel DWG 368313 and the panel is acceptable for further processing.

_____ _____

Lead Person Date

7.0 Production Complete

XXX 7.1 Process Engineering verify that the CMS ME3/1 Cathode Panel Component Soldering (5520-TR-333465) is accurate and complete. This shall include a review of all steps to ensure that all operations have been completed and signed off. Ensure that all Discrepancy Reports, Nonconformance Reports, Repair/Rework Forms, Deviation Index and dispositions have been reviewed by the Responsible Authority for conformance before being approved.

Comments:

_____ _____

Process Engineering/Designee Date

8.0 Attach the Process Engineering "OK to Proceed" Tag on the panel.

_____ _____

Process Engineering/Designee Date

9.0 Proceed to the next major assembly operation as required.